Amendments To The Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method for handling an optical pulse signal in a communication fiber link by ensuring at least one operation from the following: pulse shaping, treatment of nonlinearity and monitoring, the method comprising:

providing a signal handling device comprising one or more SHG elements, each being capable of performing a cascaded second harmonic generation (SHG) with respect to a particular fundamental harmonic (FH),

selecting at least one of said operations,

selecting an inner optical path length in said ~~signal handling device, suitable for performing at least one of said operations~~ one or more SHG elements to perform said at least one selected operation with respect to an incoming optical pulse signal carried by a wavelength defined by said particular fundamental harmonic (FH),

conveying the incoming optical pulse signal carried by said wavelength along the selected optical path in said signal handling device,

according to the selected at least one operation, obtaining from said signal handling device at least one output optical pulse signal from a list comprising:

- an output optical pulse signal at the fundamental harmonic (FH), wherein the treatment of nonlinearity and/or the pulse shaping are performed,

- an output optical pulse signal at the second harmonic (SH) for further monitoring it and judging about said input optical pulse signal.

2. (currently amended) The method according to Claim 1, enabling the operation of nonlinearity treatment, wherein ~~at the selecting step such an~~ such said inner optical path length is selected via the one or more SHG elements for conveying the incoming optical pulse signal with a known amplitude ~~via the signal handling device,~~ that is substantially close to the length upon passing which the output optical pulse signal at the fundamental harmonic (FH) reaches the maximum peak power.

3. (currently amended) The method according to Claim 1, ensuring the operation of pulse shaping, wherein ~~at the selecting step such an~~ such said inner optical path length is selected for conveying the incoming optical pulse signal with a known amplitude via the ~~signal handling device,~~ one or

more SHG elements that is substantially close to the shortest optical path length upon passing which the output optical pulse signal at the fundamental harmonic (FH) reaches the maximum peak power.

4. (currently amended) The method according to Claim 1, allowing for the monitoring operation, ~~wherein the selecting step comprises~~ comprising selecting ~~such an~~ said inner optical path length for conveying the incoming optical pulse signal via the ~~signal handling device,~~ one or more SHG elements that enables obtaining from said device the output optical pulse signal at the second harmonic (SH) with a non-zero peak power.

5. (currently amended) The method according to Claim 1, wherein the conveying is performed by passing the signal along a multi-segment trajectory in said ~~device,~~ at least one SHG element, thereby arranging an extended optical path.

6. (currently amended) The method according to Claim 5, wherein the conveying is performed via a multi-segment "zig-zag" trajectory by arranging one or more internal reflections in the ~~signal handling device.~~ at least one SHG element.

7. (original) The method according to Claim 2, for nolinearity compensation, further comprising a preliminary step of ensuring that the sign of the Kerr effect created by said device to said wavelength is negative.

8. (currently amended) The method according to Claim 1, for gradual handling of the optical signal in a fiber optic link, comprising ~~an additional step of~~ conveying ~~the outgoing~~ of the incoming optical signal via a chain including ~~at least one additional signal handling device,~~ more than one SHG elements, and wherein the ~~devices~~ SHG elements in the chain are spanned by sections of the fiber optic link.

9. (original) The method according to Claim 1, for handling optical pulse signals in a multi-channel transmission of optical data where each of the optical channels transmits a specific optical signal at a particular optical wavelength, comprising performing steps of Claim 1 with respect to each particular optical channel.

10. (original) The method according to Claim 9, comprising conveying the optical pulse signals of different said optical channels via respective different said signal handling devices.

11. (original) The method according to Claim 9, comprising conveying the optical pulse signals of different said optical channels via one and the same common signal handling device.

12. (original) The method according to Claim 9, comprising selecting optical channels with better results of the signal handling for transmitting information having higher priority.

13. (currently amended) The device according to Claim 35, for handling an optical pulse signal from the point of at least one of the following operations: pulse shaping, treatment of nonlinearity and signal monitoring,

~~the device~~ each of the one or more SHG elements being capable of performing a cascaded second harmonic generation (SHG) with respect to a particular fundamental harmonic (FH),

the device being ~~characterized by such an~~ adjustable for selecting the inner optical path ~~length selected~~ via said one or more SHG elements for an incoming optical pulse signal carried by a wavelength defined by said particular fundamental harmonic (FH), so that upon conveying said incoming optical pulse signal along the selected optical path, the device

enables obtaining at least one output optical pulse signal from a list comprising:

- an output optical pulse signal at the fundamental harmonic (FH), wherein the treatment of nonlinearity and/or the pulse shaping are performed,

- an output optical pulse signal at the second harmonic (SH) suitable for further monitoring and judging about said input optical pulse signal.

14. (previously presented) The device according to Claim 33, having the optical path length close to the shortest one upon passing which the outgoing FH optical pulse signal reaches the maximum peak power, thereby suitable for pulse shaping.

15. (currently amended) The device according to Claim 13, ~~comprising a~~ wherein said at least one second-harmonic-generating (SHG) element is selected from a non-exhaustive list including: a second harmonic generating (SHG) optical crystal and a second harmonic generating (SHG) polymer fiber.

16. (previously presented) The device according to Claim 15, wherein said SHG element constitutes an SHG optical

crystal selected from a non-exhaustive list comprising KTP, KDP and BBO.

17. (currently amended) A device according to Claim 35,

~~13, if applied at a particular wavelength, from the point of~~ said at least one ~~of the following operations: pulse shaping, treatment of nonlinearity and signal monitoring,~~

~~the device] comprising an element for performing the cascaded Second Harmonic Generation,~~

~~said~~ SHG element being covered by mirror surfaces at least at its two opposite facets and leaving at least two windows at said opposite facets for an incoming optical beam and an outgoing optical beam respectively, the arrangement being such to create one or more internal reflections of the optical beam if passing between said two windows, thereby providing an extended internal optical path.

18. (previously presented) The device according to Claim 17, wherein said extended internal optical path has the length suitable for obtaining the output optical pulse signal on the fundamental harmonic (FH) with a peak power close to maximum and/or the output optical pulse signal on the second harmonic (SH) with a non-zero peak power.

19. (currently amended) The device according to Claim 18 suitable for pulse shaping, ~~the device~~ having substantially the shortest length of the extended internal optical path, upon passing which the output FH optical pulse signal reaches the maximum peak power.

20. (currently amended) The device according to Claim 17, wherein the said at least one SHG element has a cubic form.

21. (currently amended) The device according to Claim 17, wherein said at least one SHG element is provided with more than two said windows, thereby enabling selection and activation of any pair of such windows for selecting and/or adjusting length of said internal optical path.

22. (original) The device according to Claim 17, further provided with collimators associated with said windows and serving for adjusting the incident angle of the light beam.

23. (original) The device according to Claim 17, adapted for signal handling in a multi-channel transmission format wherein multiple channels transmit optical signals at respective wavelengths differing from each other, said device

being capable of Second Harmonic Generation (SHG) with respect to the wavelengths of more than one channels of said format.

24. (original) The device according to Claim 23, wherein the pulse treatment device, being capable of SHG with respect to the wavelengths of a number of the multiple optical channels, is divided into the number of layers for respectively conveying there-through optical signals of said number of the multiple optical channels.

25. (original) The device according to Claim 24, wherein the layers are separated from one another geometrically.

26. (original) The device according to Claim 25, wherein the layers are separated from one another by wavelength filtering means.

27. (original) The device according to Claim 17, integrated with an optical amplifier and placed immediately after said amplifier.

28. (currently amended) A system for handling optical signals passing via optical fiber links from the point of pulse shaping, nonlinearity treatment and/or monitoring, the system comprising two or more ~~signal handling~~ devices

according to Claim 13, inserted in one or more optical fiber links and operative to perform pulse shaping, nonlinearity treatment and/or monitoring with respect to at least one optical pulse signal.

29. (currently amended) A method for designing a device for handling optical signals in a communication fiber link from the point of at least one operation from a list comprising nonlinearity treatment, pulse shaping and monitoring of an optical pulse if applied to the device at a particular wavelength, the method comprising:

selecting a Second Harmonic Generating (SHG) element ~~for the device,~~ sensitive to a fundamental harmonic (FH) defined by the particular wavelength;

selecting, by a suitable calculation, ~~at least~~ more than one relation between amplitude of the pulse to be applied to the pulse-treatment device at said wavelength and an inner optical path to be passed in the ~~device~~ element to ensure selective obtaining of either the maximum output peak power of an outgoing pulse signal at the FH, or a non-zero peak output power of an outgoing pulse signal at the SH;

arranging ~~for at least one input port and at least one output port defining at least one optical path of the selected relations.~~ input and output ports for obtaining

there-between different inner optical paths according to the selected relations.

30. (original) The method according to Claim 29, comprising the design of the element with mirror surfaces so as to form between the input and output ports at least one multi-segment trajectory resulting from internal reflections in the element.

31. (previously presented) The method according to Claim 29 comprising, for effective pulse shaping, the selecting of the SHG element with smaller values of its mismatch parameter.

32. (previously presented) A system for handling optical signals, passing via optical fiber links, from the point of pulse shaping, nonlinearity treatment and/or monitoring, the system comprising two or more signal handling devices according to Claim 17, inserted in one or more optical fiber links and operative to perform pulse shaping, nonlinearity treatment and/or monitoring with respect to at least one optical pulse signal.

33. (previously presented) The device according to Claim 13, having the optical path length such that upon conveying said incoming FH optical pulse signal through said

device, the output optical pulse signal at the fundamental harmonic (FH) reaches the maximal peak power, the device being thus suitable for treatment of non-linearity.

34. (previously presented) The device according to Claim 13, having the optical path length enabling the output optical pulse signal at the second harmonic (SH) with the non-zero peak power, the device being thereby suitable for signal monitoring.

35. (new) A device for handling an optical pulse signal in a fiber communication link, the device comprising one or more second harmonic generating (SHG) elements and is adapted to provide a selectively adjustable inner optical path for said optical pulse signal via said one or more SHG elements.

36. (new) The element according to Claim 13, having relatively small value of its mismatch parameter for effective pulse shaping.

37. (new) A device for handling an optical pulse signal from the point of at least one of the following operations: pulse shaping, treatment of nonlinearity and signal monitoring,

the device being capable of performing a cascaded second harmonic generation (SHG) with respect to a particular fundamental harmonic (FH),

the device being characterized by such an optical path length selected for an incoming optical pulse signal carried by a wavelength defined by said particular fundamental harmonic (FH), that upon conveying said incoming optical pulse signal along the selected optical path, the device enables obtaining at least one output optical pulse signal from a list comprising:

- an output optical pulse signal at the fundamental harmonic (FH), wherein the treatment of nonlinearity and/or the pulse shaping are performed,
- an output optical pulse signal at the second harmonic (SH) suitable for further monitoring and judging about said input optical pulse signal, and

the device further comprising an SHG element for performing the cascaded Second Harmonic Generation, said element being covered by mirror surfaces at least at its two opposite facets and leaving at least two windows at said opposite facets for an incoming optical beam and an outgoing optical beam respectively, the arrangement being such to create one or more internal reflections of the optical beam if

passing between said two windows, thereby providing an extended internal optical path.